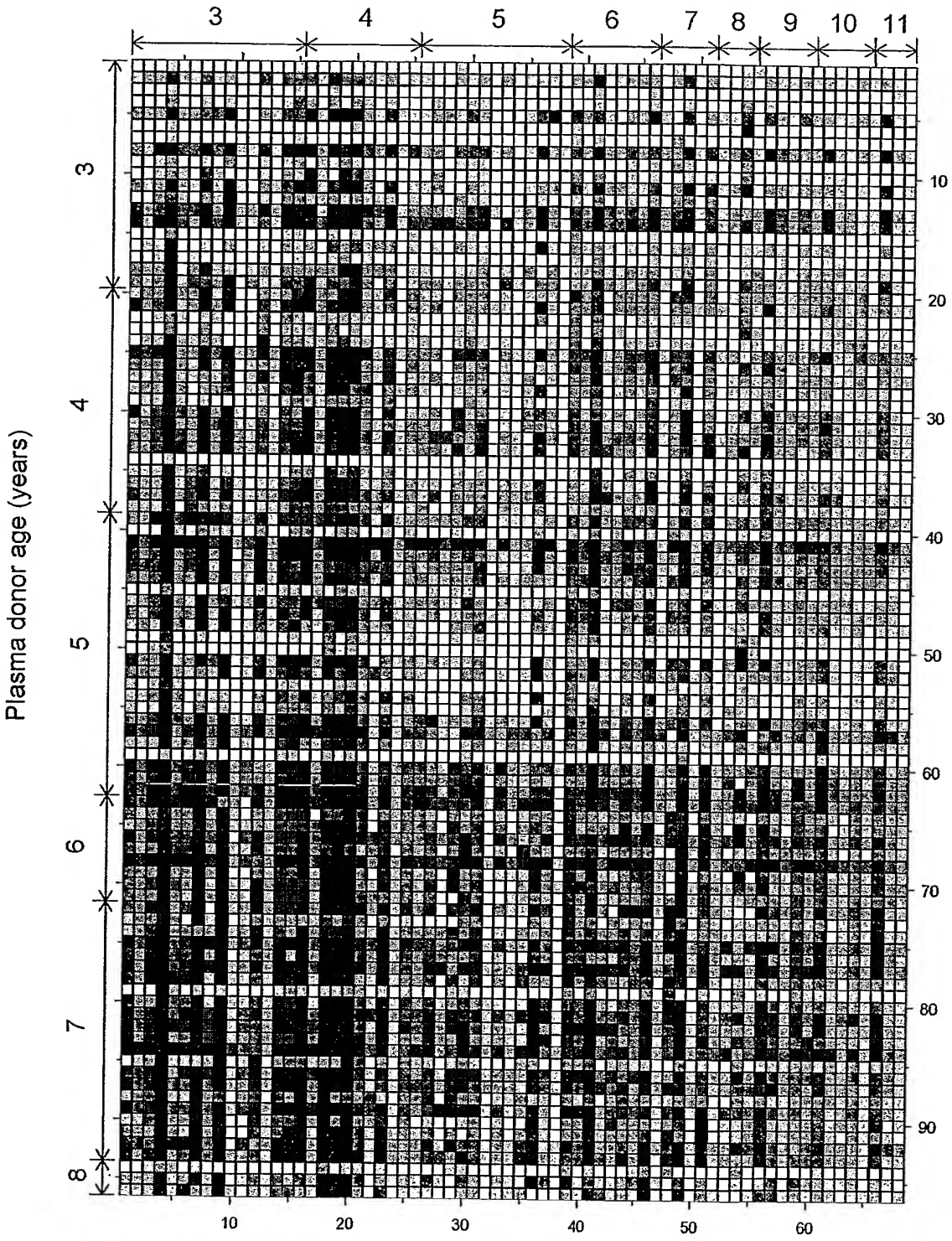

Parasite donor age (years)
3
4
5
6
7
8
9
10
11
Plasma donor age (years)
3
4
5
6
7
8
10
20
30
40
50
60
70
80
90
10
20
30
40
50
60

Fig. 1

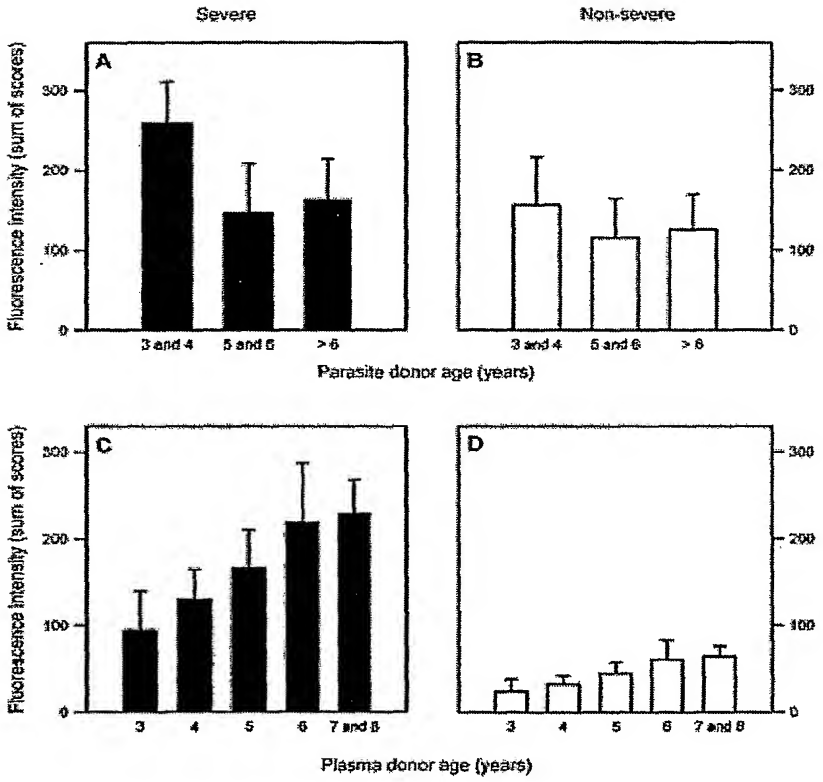

Severe
Non-severe
A
B
C
D
Fluorescence intensity (sum of scores)
0
100
200
300
3 and 4
5 and 6
> 6
Parasite donor age (years)
3
4
5
6
7 and 8
Plasma donor age (years)

Fig. 2

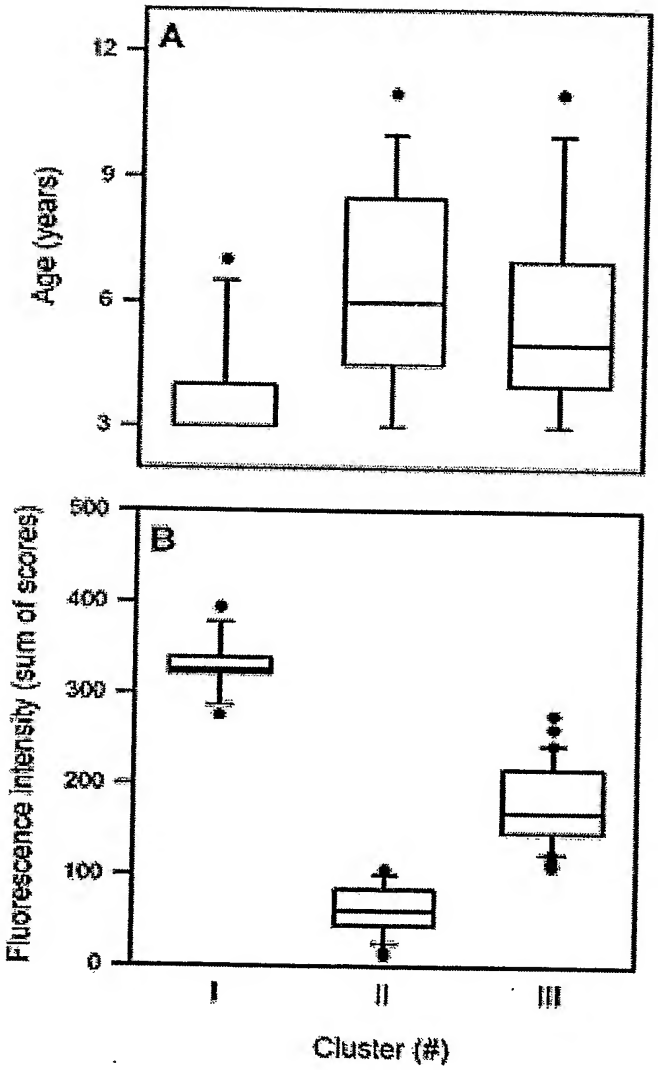

A
12
9
6
3
Age (years)
B
500
400
300
200
100
0
Fluorescence intensity (sum of scores)
I
II
III
Cluster (#)

Fig. 3

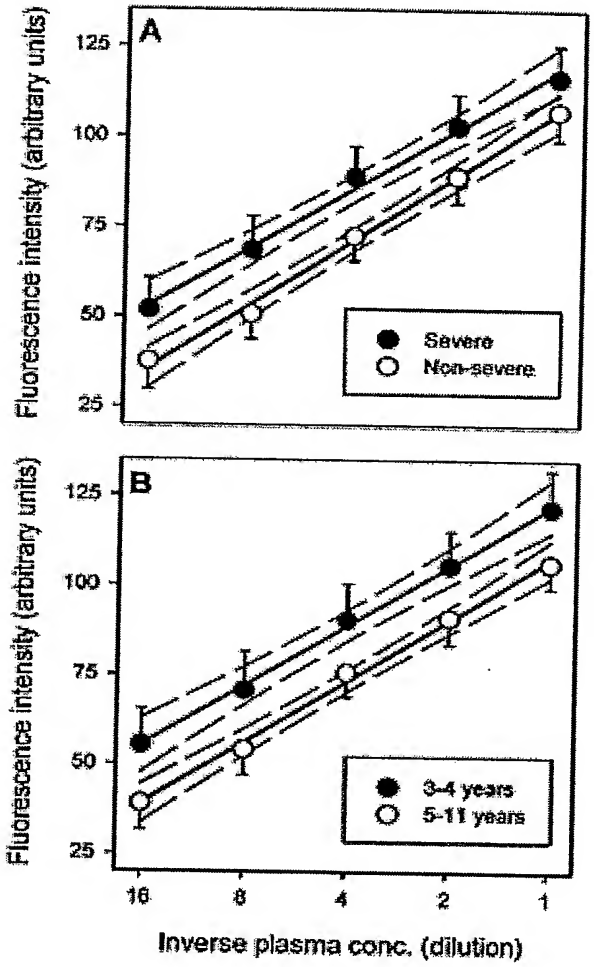

A
B
Fluorescence intensity (arbitrary units)
125
100
75
50
25
Severe
Non-severe
3-4 years
5-11 years
16
8
4
2
1
Inverse plasma conc. (dilution)

Fig. 4

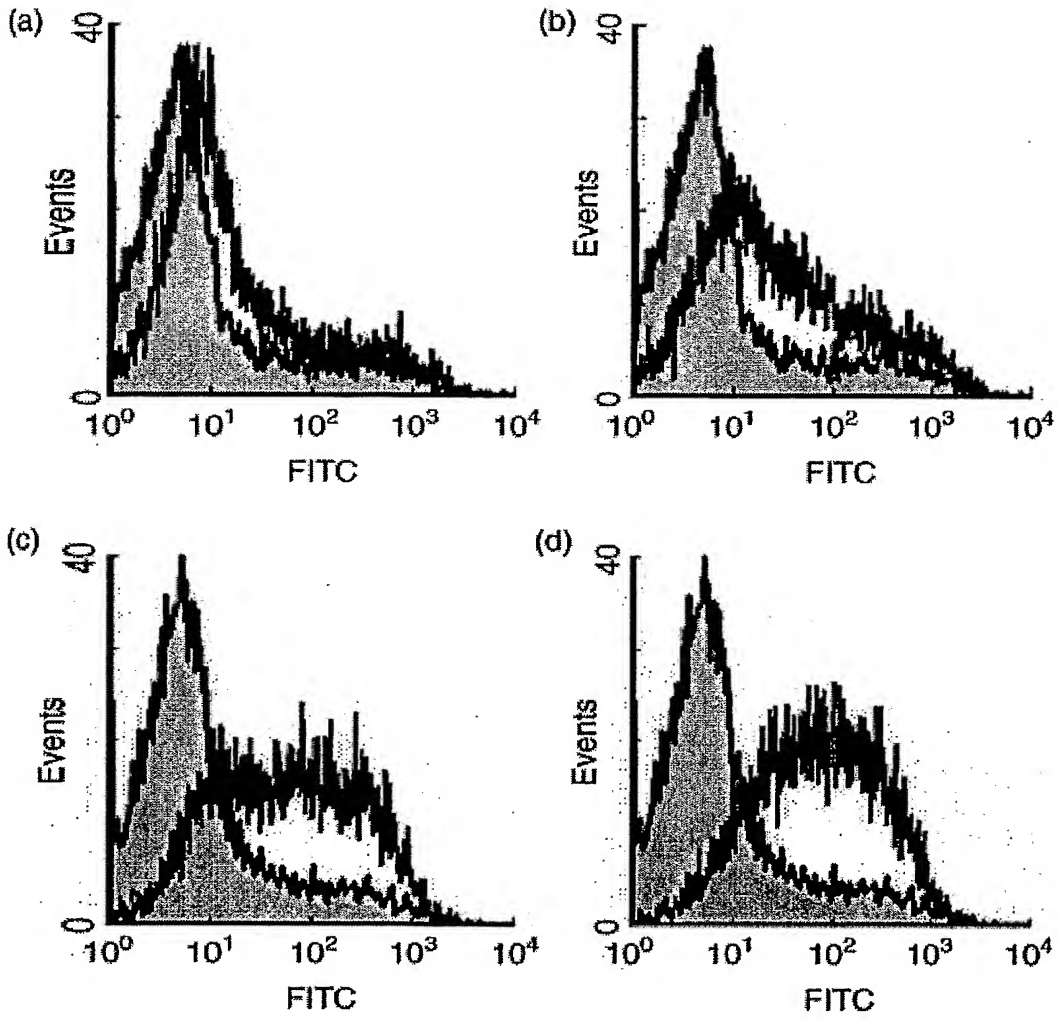



Fig. 5

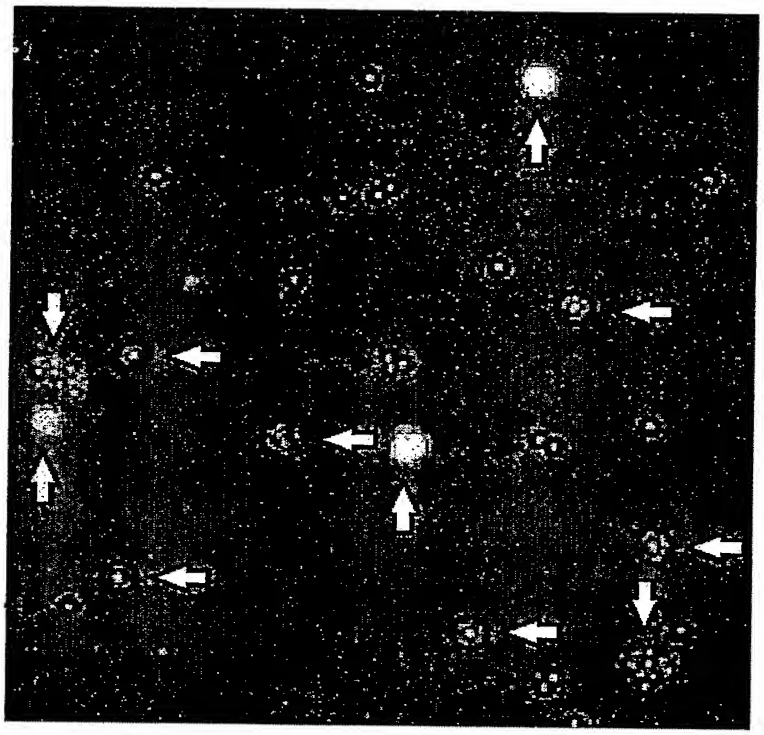


Fig. 6

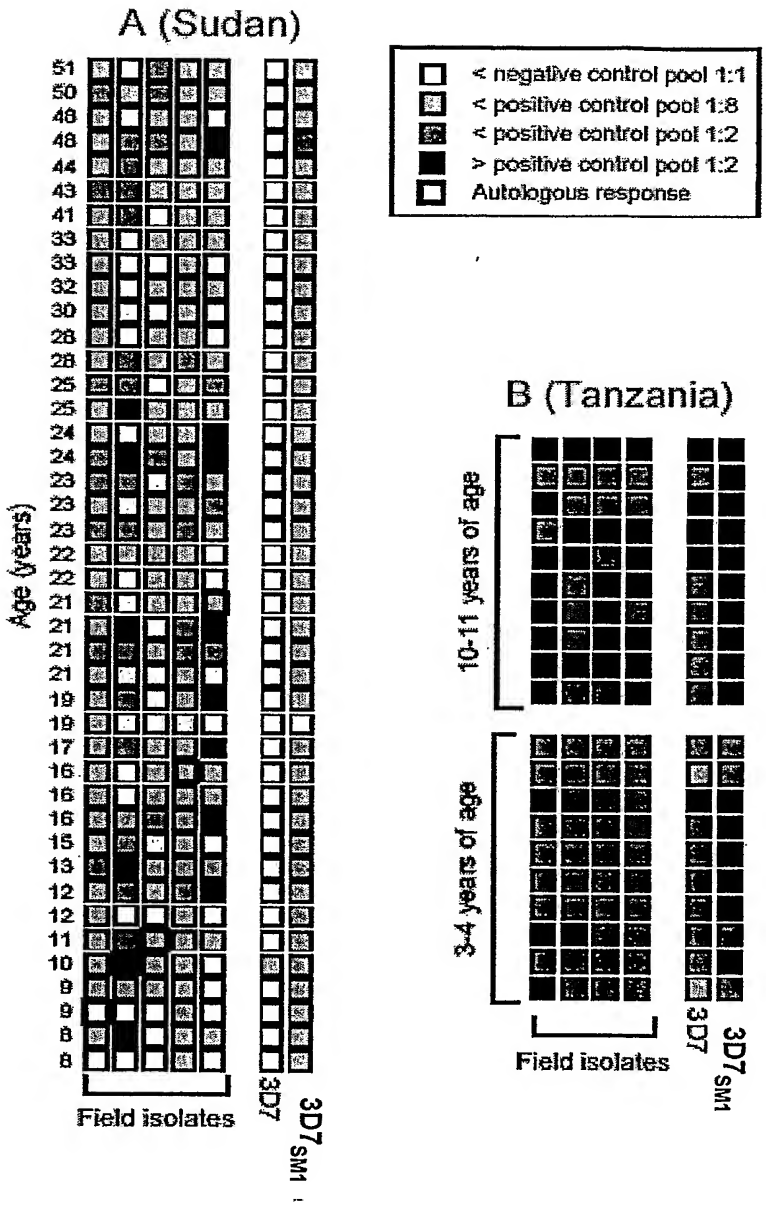

A (Sudan)
Age (years)
51
50
46
46
44
43
41
33
33
32
30
28
28
25
25
24
24
23
23
23
22
22
21
21
21
21
19
19
17
16
16
16
15
13
12
12
11
10
9
9
8
8
Field isolates
3D7
3D7SM1
< negative control pool 1:1
< positive control pool 1:8
< positive control pool 1:2
> positive control pool 1:2
Autologous response
B (Tanzania)
10-11 years of age
3-4 years of age
Field isolates
3D7
3D7SM1

Fig. 7

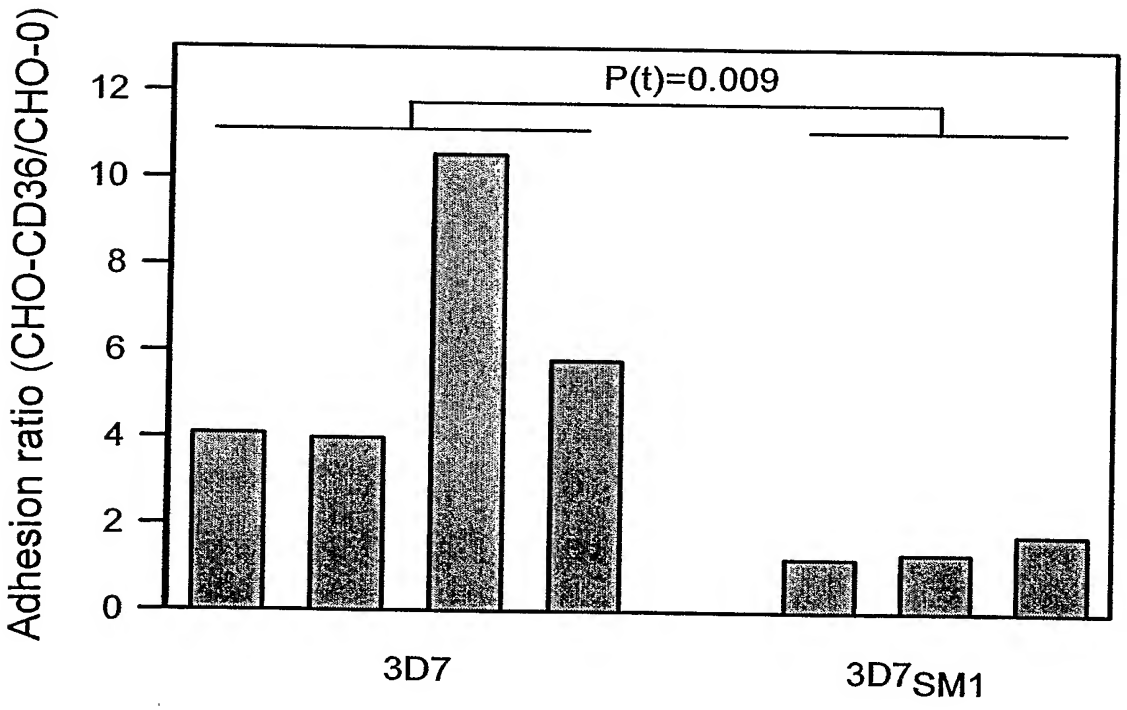



Fig. 8

| Gene | Location | Orientation (transcribed towards) | 5' region | DBL1-CIDR1 | Intron | ATS | 3' region | Domain structure | | |

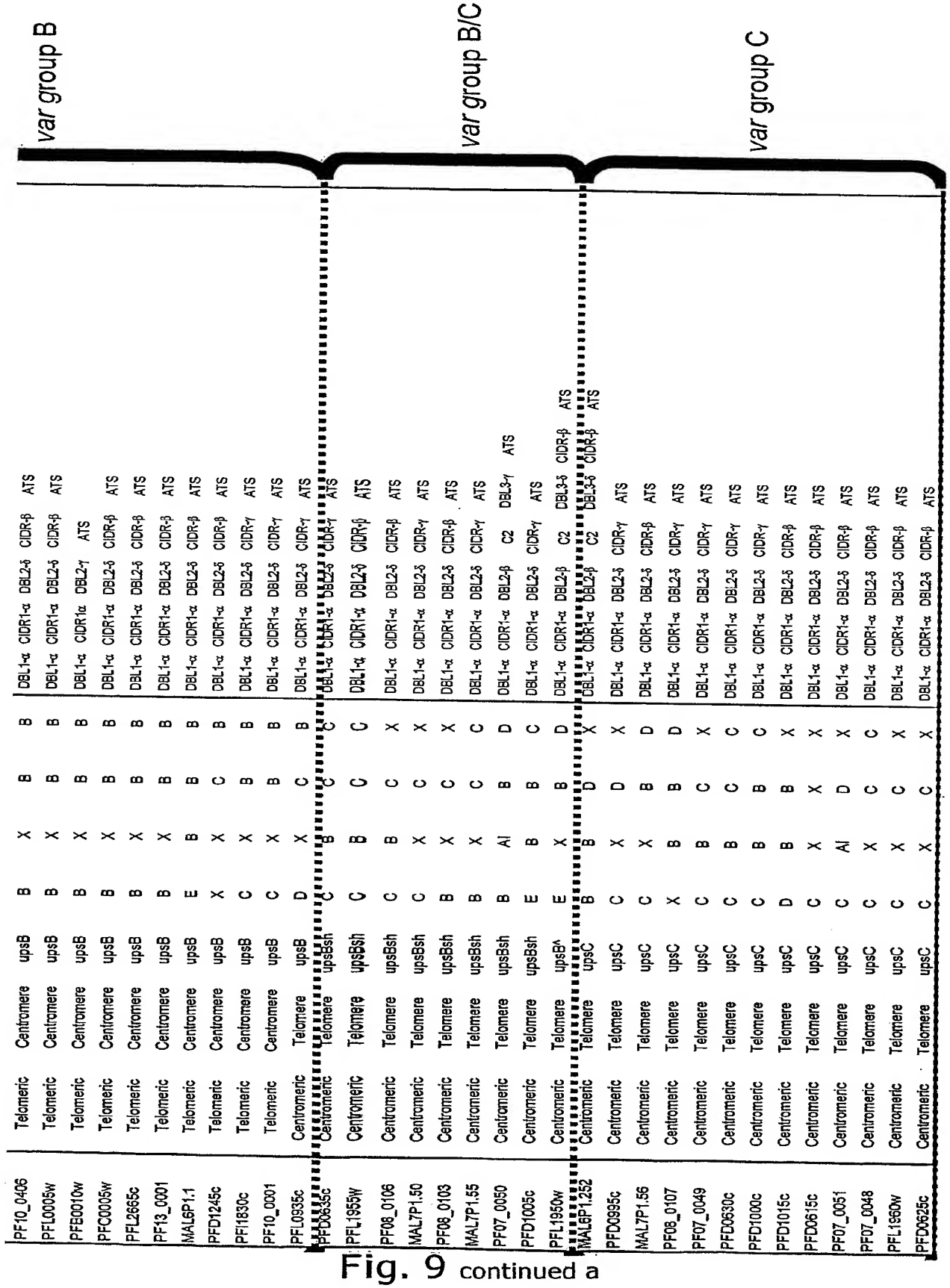
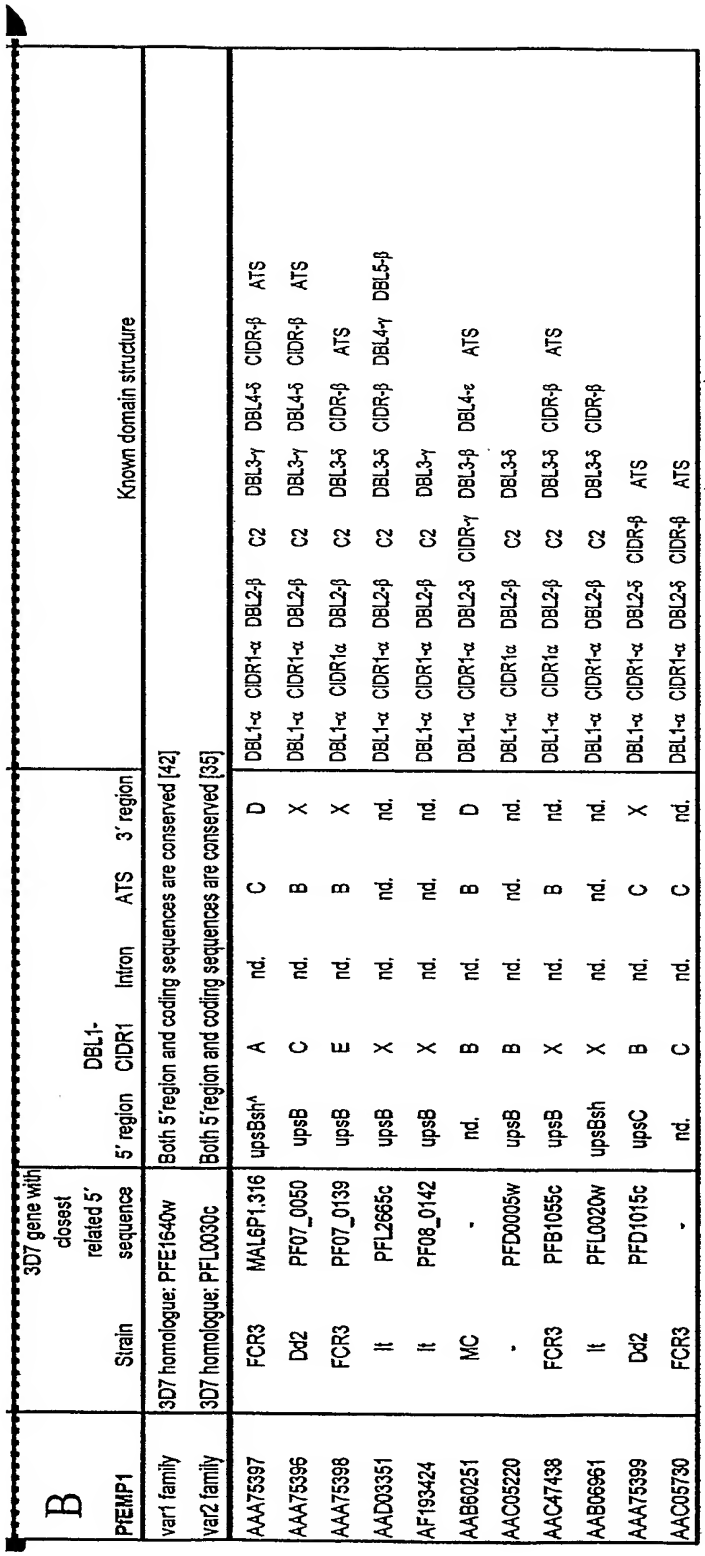



Fig. 9 continued a



B

| PfEMP1 | Strain | 3D7 gene with dosest related 5' sequence | DBL1-CIDR1 5' region | DBL1-CIDR1 | Intron | ATS | 3' region | Known domain structure | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| var1 family | 3D7 homologue: PFE1640w | | Both 5'region and coding sequences are conserved [42] | | | | | | | | | | | | | |
| var2 family | 3D7 homologue: PFL0030c | | Both 5'region and coding sequences are conserved [35] | | | | | | | | | | | | | |
| AAA75397 | FCR3 | MAL6P1.316 | upsBsh^ | A | nd. | C | D | DBL1-α | CIDR1-α | DBL2-β | C2 | DBL3-γ | DBL4-δ | CIDR-β | ATS | |
| AAA75396 | Dd2 | PF07_0050 | upsB | C | nd. | B | X | DBL1-α | CIDR1-α | DBL2-β | C2 | DBL3-γ | DBL4-δ | CIDR-β | ATS | |
| AAA75398 | FCR3 | PF07_0139 | upsB | E | nd. | B | X | DBL1-α | CIDR1α | DBL2-β | C2 | DBL3-δ | CIDR-β | ATS | | |
| AAD03351 | It | PFL2665c | upsB | X | nd. | nd. | nd. | DBL1-α | CIDR1-α | DBL2-β | C2 | DBL3-δ | CIDR-β | DBL4-γ | DBL5-β | |
| AF193424 | It | PF08_0142 | upsB | X | nd. | nd. | nd. | DBL1-α | CIDR1-α | DBL2-β | C2 | DBL3-γ | | | | |
| AAB60251 | MC | - | nd. | B | nd. | B | D | DBL1-α | CIDR1-α | DBL2-δ | CIDR-γ | DBL3-β | DBL4-ε | ATS | | |
| AAC05220 | - | PFD0005w | upsB | B | nd. | nd. | nd. | DBL1-α | CIDR1α | DBL2-β | C2 | DBL3-δ | | | | |
| AAC47438 | FCR3 | PFB1055c | upsB | X | nd. | B | nd. | DBL1-α | CIDR1α | DBL2-β | C2 | DBL3-δ | CIDR-β | ATS | | |
| AAB06961 | It | PFL0020w | upsBsh | X | nd. | nd. | nd. | DBL1-α | CIDR1-α | DBL2-β | C2 | DBL3-δ | CIDR-β | | | |
| AAA75399 | Dd2 | PFD1015c | upsC | B | nd. | C | X | DBL1-α | CIDR1-α | DBL2-δ | CIDR-β | ATS | | | | |
| AAC05730 | FCR3 | - | nd. | C | nd. | C | nd. | DBL1-α | CIDR1-α | DBL2-δ | CIDR-β | ATS | | | | |

Fig. 9 continued b

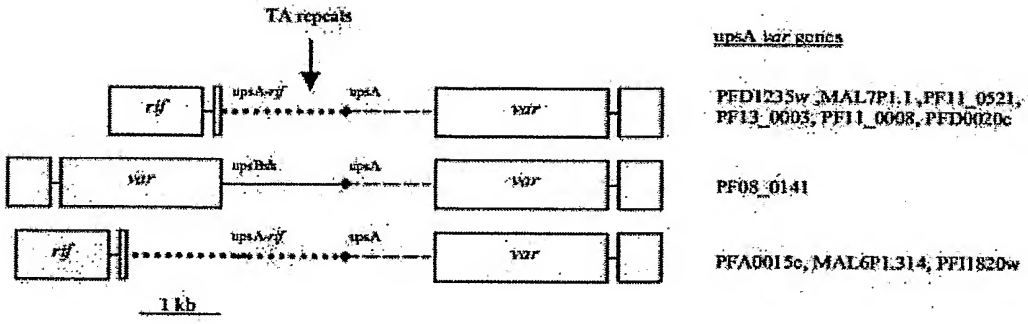

TA repeats
upsA var genes
rif
upsA-rif
upsA
var
PFD1235w, MAL7P1.1, PF11_0521, PF13_0003, PF11_0008, PFD0020c
var
upsBsA
upsA
var
PF08_0141
rif
upsA-rif
upsA
var
PFA0015c, MAL6P1.314, PFI1820w
1 kb

Fig. 10

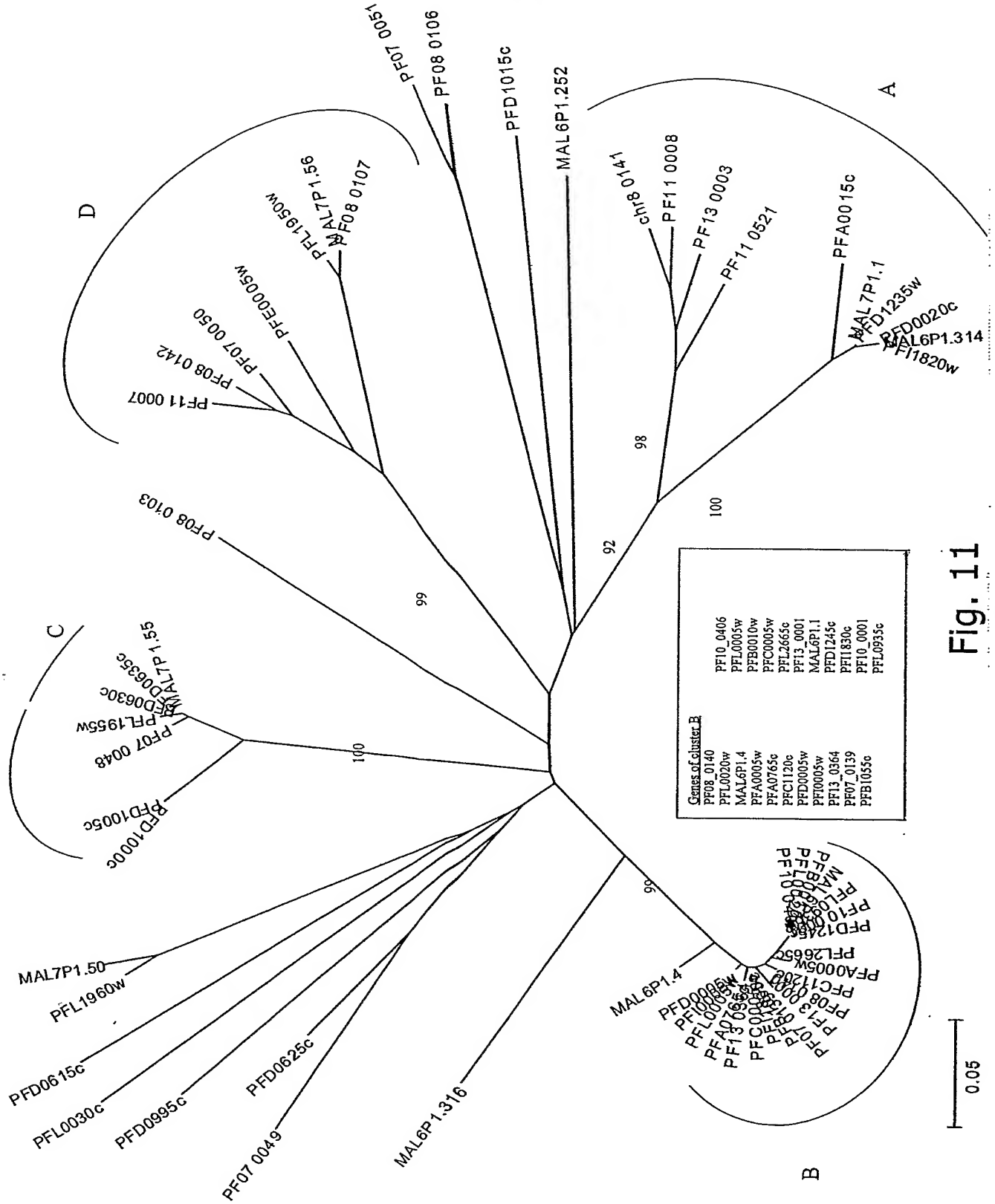

A
B
C
D
PF07 0051
PF08 0106
PFD1015c
MAL6P1.252
chr8 0141
PF11 0008
PF13 0003
PF11 0521
PFA0015c
MAL7P1.1
PFD1235w
PFD0020c
MAL6P1.314
PFI1820w
PF08 0107
MAL7P1.56
PFL1950w
PFE0005w
PF07 0050
PF08 0142
PF11 0007
PF08 0103
MAL7P1.55
PFD0630c
PFL1955w
PF07 0048
PFD1005c
PFD1000c
MAL7P1.50
PFL1960w
PFD0615c
PFL0030c
PFD0995c
PFD0625c
PF07 0049
MAL6P1.316
MAL6P1.4
PFD0005w
PFL0005w
PFA0005w
PFC1120c
PFL2665c
PFD1245c
PFI1830c
PFL0935c
100
92
98
99
100
99
Genes of cluster B
PF08_0140
PFL0020w
MAL6P1.4
PFA0005w
PFA0765c
PFC1120c
PFD0005w
PF10_0406
PFL0005w
PFB0010w
PFC0005w
PFL2665c
PF13_0001
MAL6P1.1
PFD1245c
PFI1830c
PF07_0139
PFB1055c
PF10_0001
PFL0935c
0.05

Fig. 11

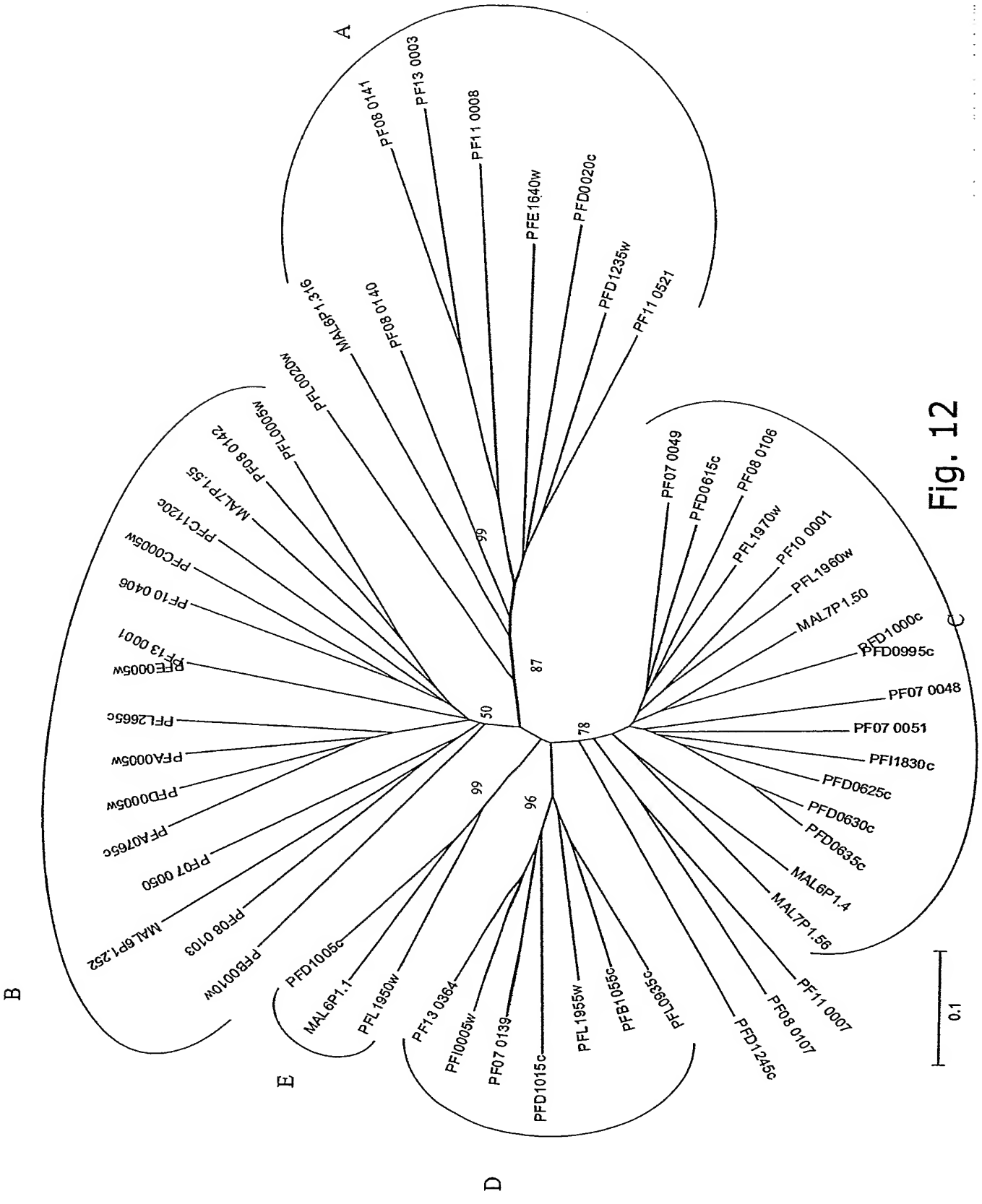

A
B
C
D
E
PF08 0141
PF13 0003
PF11 0008
PFE1640w
PFD0020c
PFD1235w
PF11 0521
MAL6P1.316
PF08 0140
PFL0020w
PFL0005w
PF08 0142
MAL7P1.55
PFC1120c
PFC0005w
PF10 0406
PFE0005w
PF13 0001
PFL2665c
PFA0005w
PFD0005w
PFA0765c
PF07 0050
MAL6P1.252
PF08 0103
PFB0010w
PFD1005c
MAL6P1.1
PFL1950w
PF13 0364
PFI0005w
PF07 0139
PFD1015c
PFL1955w
PFB1055c
PFL0935c
PFD1245c
PF08 0107
PF11 0007
MAL6P1.4
MAL7P1.56
PFD0635c
PFD0630c
PFD0625c
PFI1830c
PF07 0051
PF07 0048
PFD0995c
PFD1000c
MAL7P1.50
PFL1960w
PF10 0001
PFL1970w
PFD0615c
PF07 0049
99
87
50
78
99
96
0.1

Fig. 12

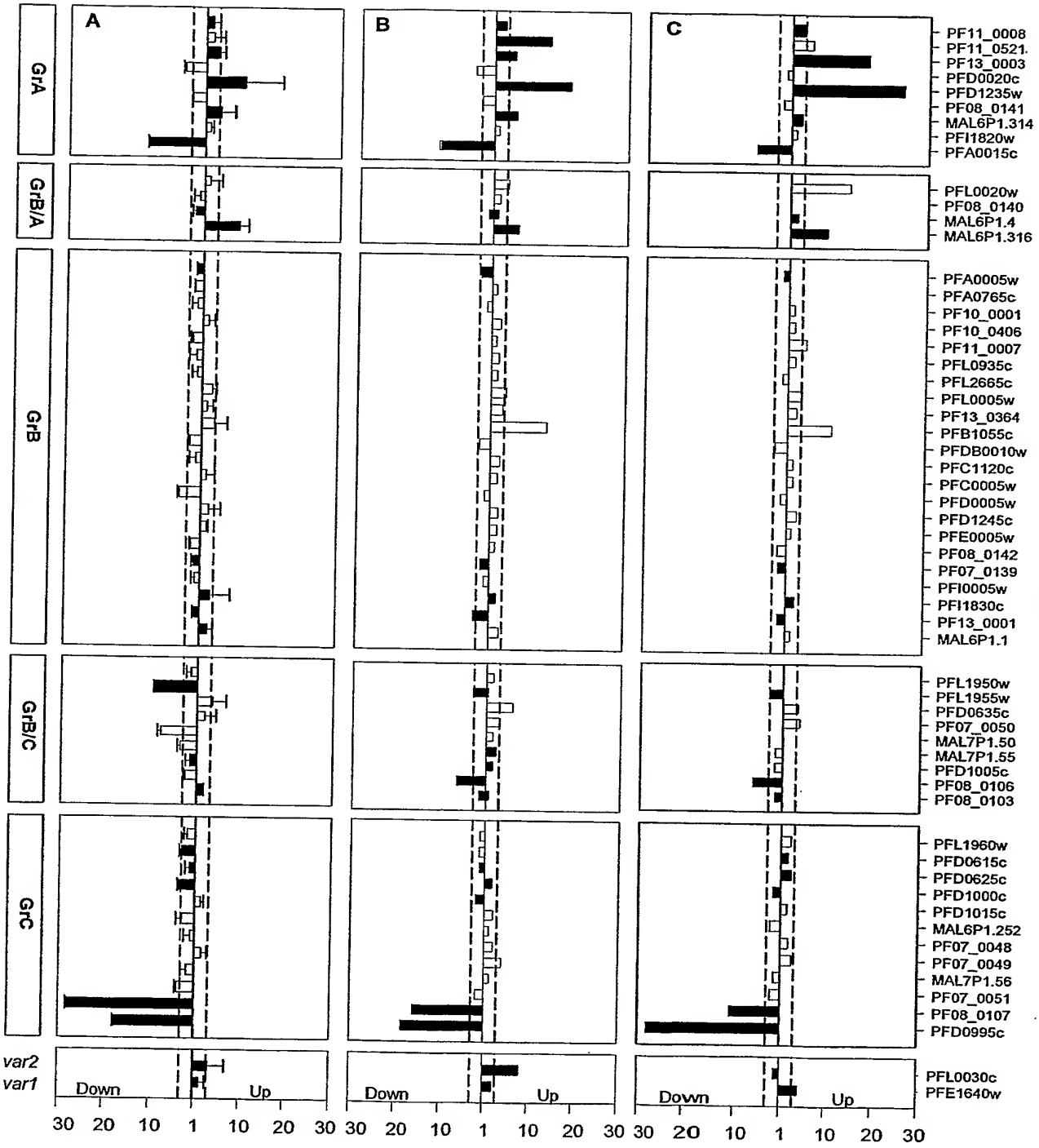

A
B
C
GrA
GrB/A
GrB
GrB/C
GrC
var2
var1
Down
Up
30 20 10 1 10 20 30
PF11_0008
PF11_0521
PF13_0003
PFD0020c
PFD1235w
PF08_0141
MAL6P1.314
PFI1820w
PFA0015c
PFL0020w
PF08_0140
MAL6P1.4
MAL6P1.316
PFA0005w
PFA0765c
PF10_0001
PF10_0406
PF11_0007
PFL0935c
PFL2665c
PFL0005w
PF13_0364
PFB1055c
PFDB0010w
PFC1120c
PFC0005w
PFD0005w
PFD1245c
PFE0005w
PF08_0142
PF07_0139
PFI0005w
PFI1830c
PF13_0001
MAL6P1.1
PFL1950w
PFL1955w
PFD0635c
PF07_0050
MAL7P1.50
MAL7P1.55
PFD1005c
PF08_0106
PF08_0103
PFL1960w
PFD0615c
PFD0625c
PFD1000c
PFD1015c
MAL6P1.252
PF07_0048
PF07_0049
MAL7P1.56
PF07_0051
PF08_0107
PFD0995c
PFL0030c
PFE1640w

Fig. 13

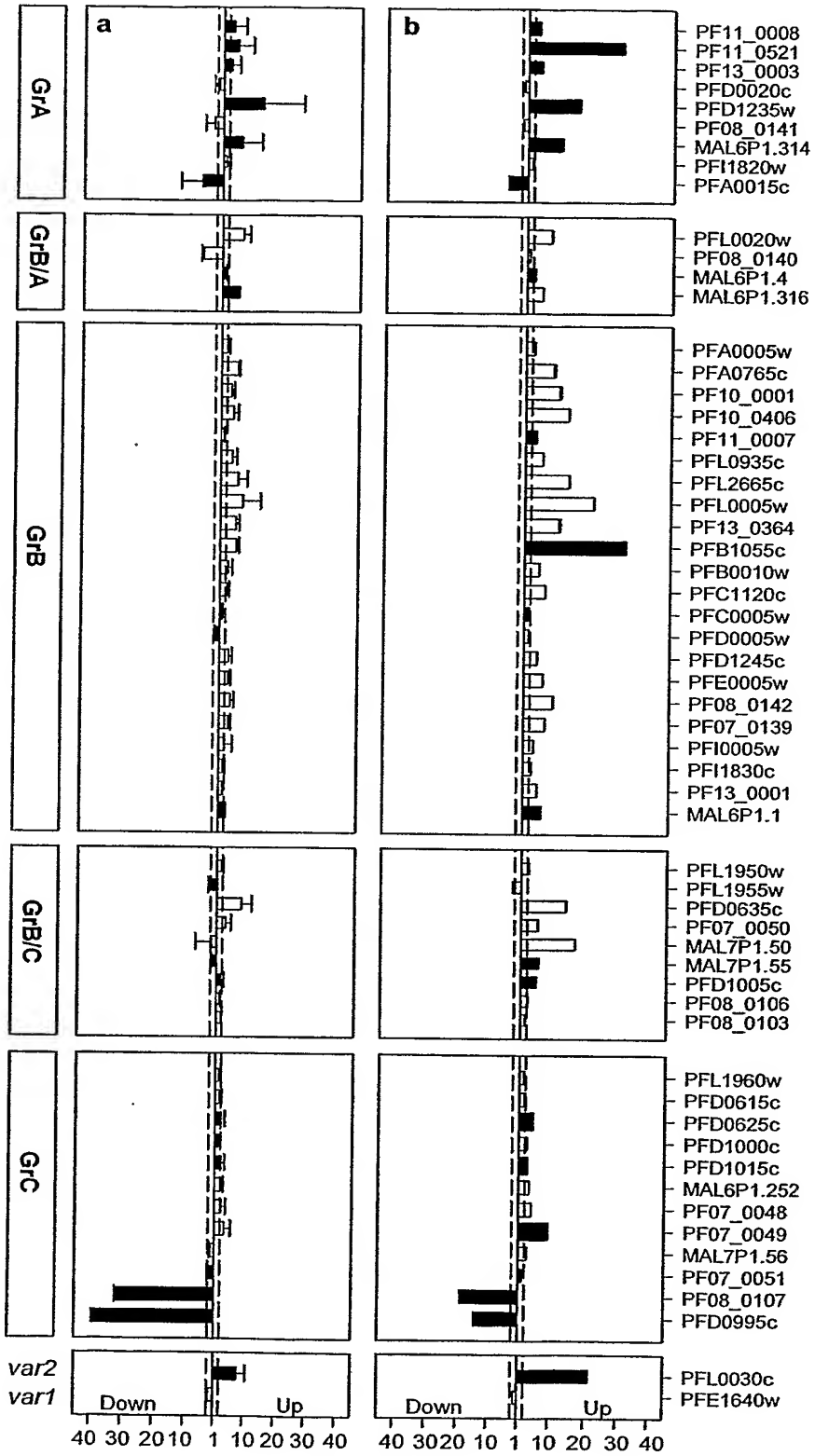

a
b
GrA
GrB/A
GrB
GrB/C
GrC
var2
var1
Down
Up
40 30 20 10 1 10 20 30 40
PF11_0008
PF11_0521
PF13_0003
PFD0020c
PFD1235w
PF08_0141
MAL6P1.314
PFI1820w
PFA0015c
PFL0020w
PF08_0140
MAL6P1.4
MAL6P1.316
PFA0005w
PFA0765c
PF10_0001
PF10_0406
PF11_0007
PFL0935c
PFL2665c
PFL0005w
PF13_0364
PFB1055c
PFB0010w
PFC1120c
PFC0005w
PFD0005w
PFD1245c
PFE0005w
PF08_0142
PF07_0139
PFI0005w
PFI1830c
PF13_0001
MAL6P1.1
PFL1950w
PFL1955w
PFD0635c
PF07_0050
MAL7P1.50
MAL7P1.55
PFD1005c
PF08_0106
PF08_0103
PFL1960w
PFD0615c
PFD0625c
PFD1000c
PFD1015c
MAL6P1.252
PF07_0048
PF07_0049
MAL7P1.56
PF07_0051
PF08_0107
PFD0995c
PFL0030c
PFE1640w

Fig. 14

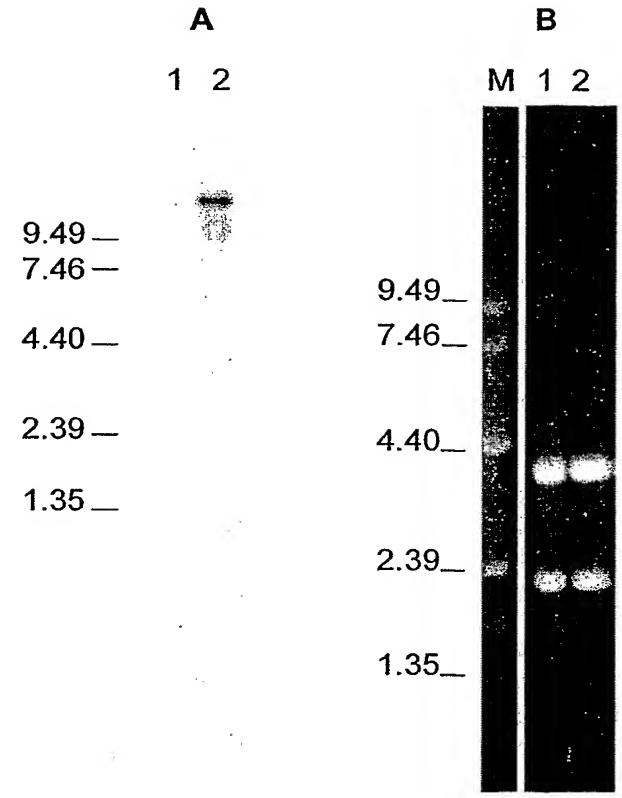

A
1 2
9.49
7.46
4.40
2.39
1.35
B
M 1 2
9.49
7.46
4.40
2.39
1.35
Probe
PFD1235w/
MAL7P1.1
SEQ ID NO 1
Ethidium
bromide

Fig. 15

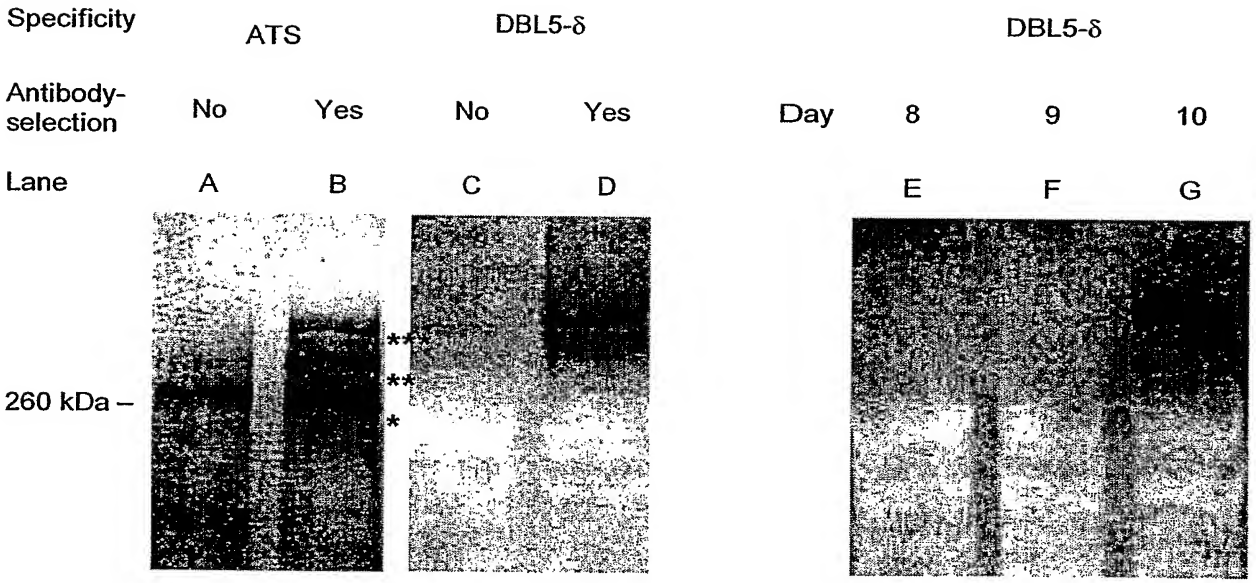

Specificity
ATS
DBL5-δ
DBL5-δ
Antibody-selection
No
Yes
No
Yes
Day
8
9
10
Lane
A
B
C
D
E
F
G
260 kDa –
**
**
*

Fig. 16

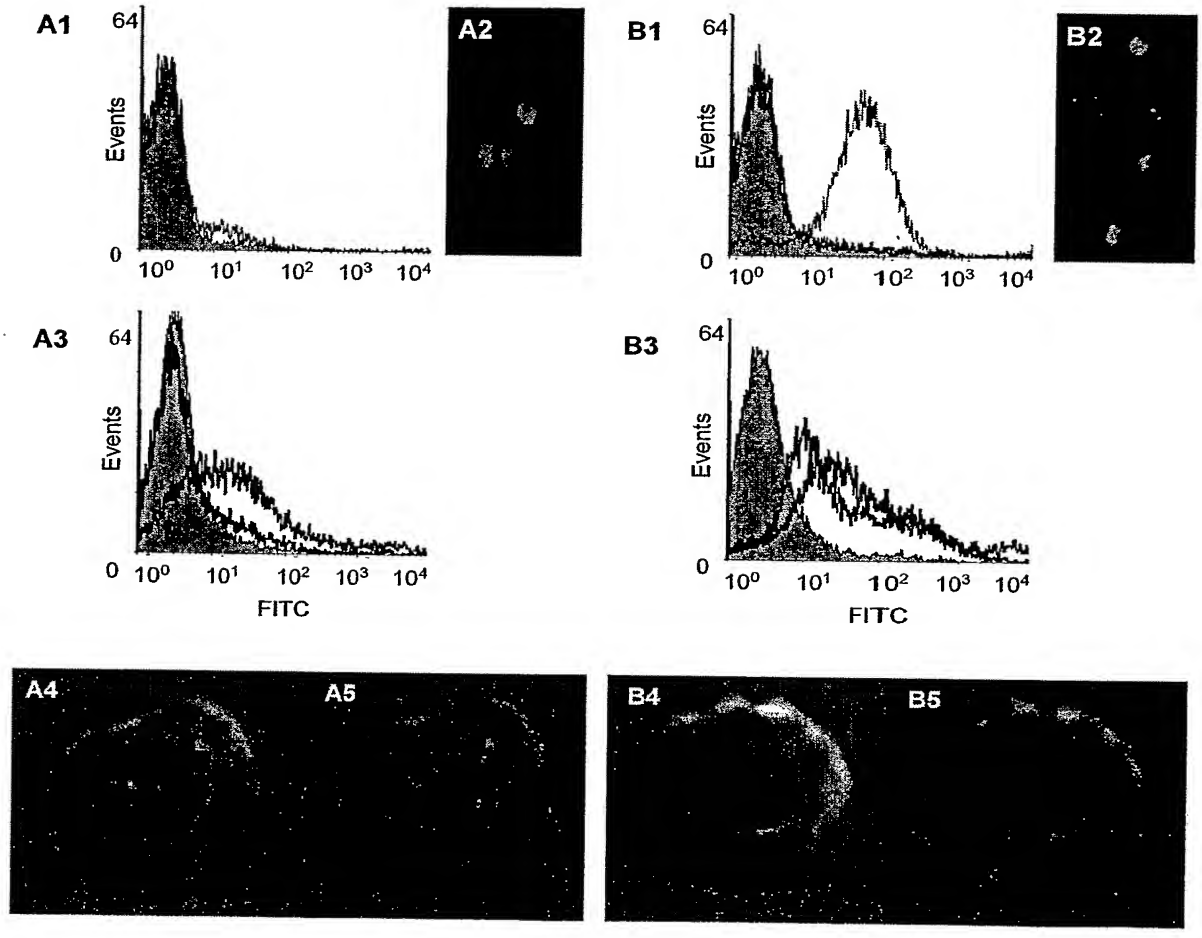

A1
64
Events
0
$10^0$ $10^1$ $10^2$ $10^3$ $10^4$
A2
B1
64
Events
0
$10^0$ $10^1$ $10^2$ $10^3$ $10^4$
B2
A3
64
Events
0
$10^0$ $10^1$ $10^2$ $10^3$ $10^4$
FITC
B3
64
Events
0
$10^0$ $10^1$ $10^2$ $10^3$ $10^4$
FITC
A4
A5
B4
B5

Fig. 17

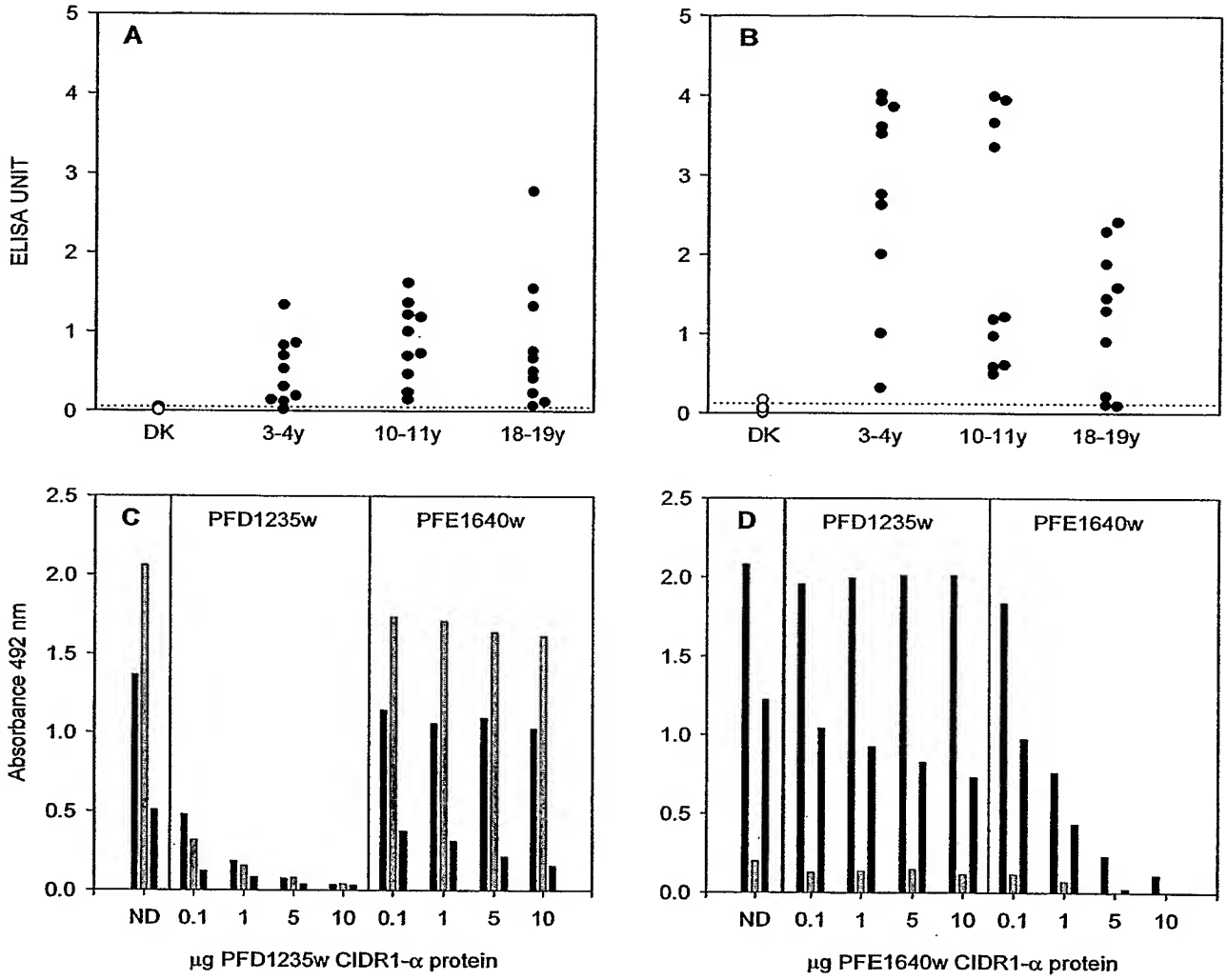

A
B
C
D
ELISA UNIT
Absorbance 492 nm
DK
3-4y
10-11y
18-19y
PFD1235w
PFE1640w
ND
0.1
1
5
10
µg PFD1235w CIDR1-α protein
µg PFE1640w CIDR1-α protein

Fig. 18

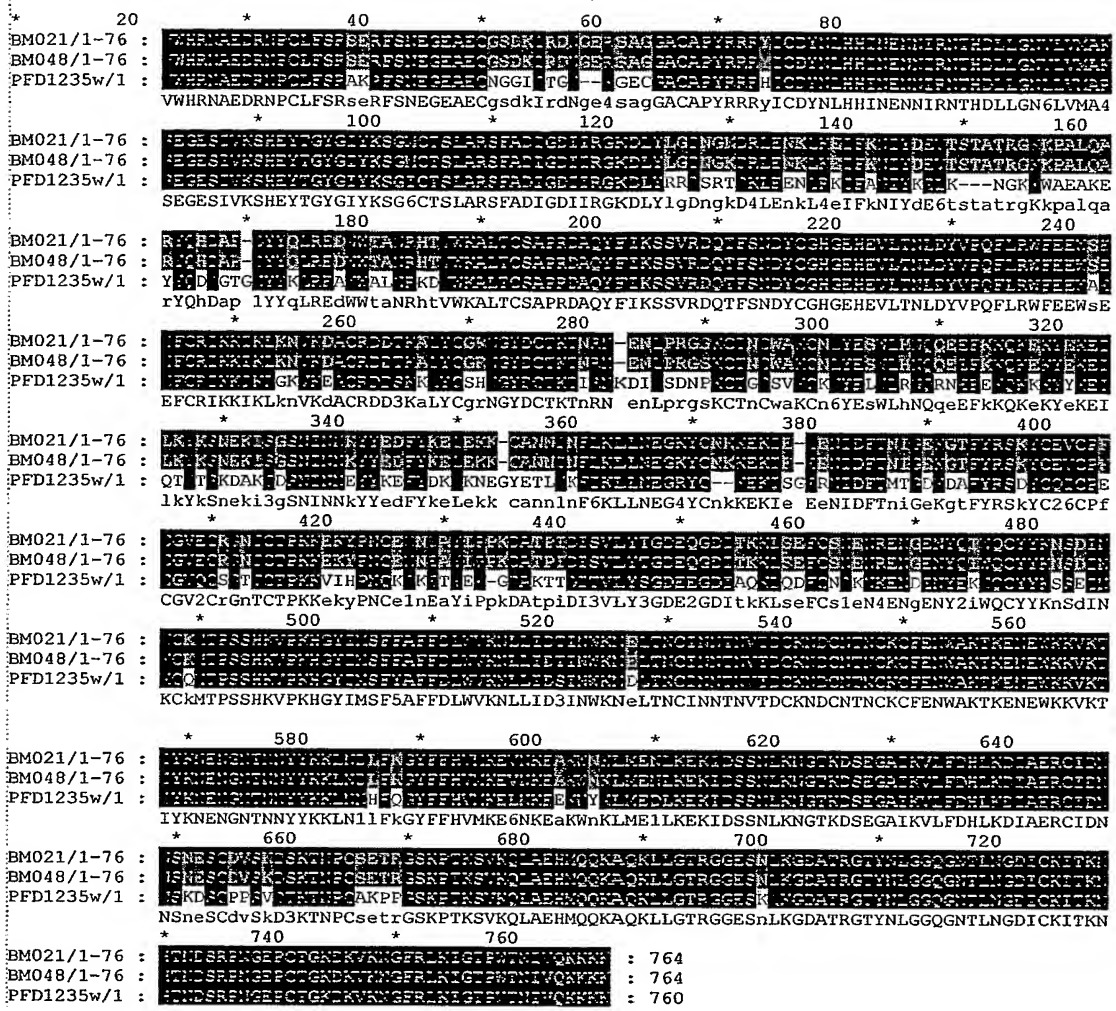



Fig. 19

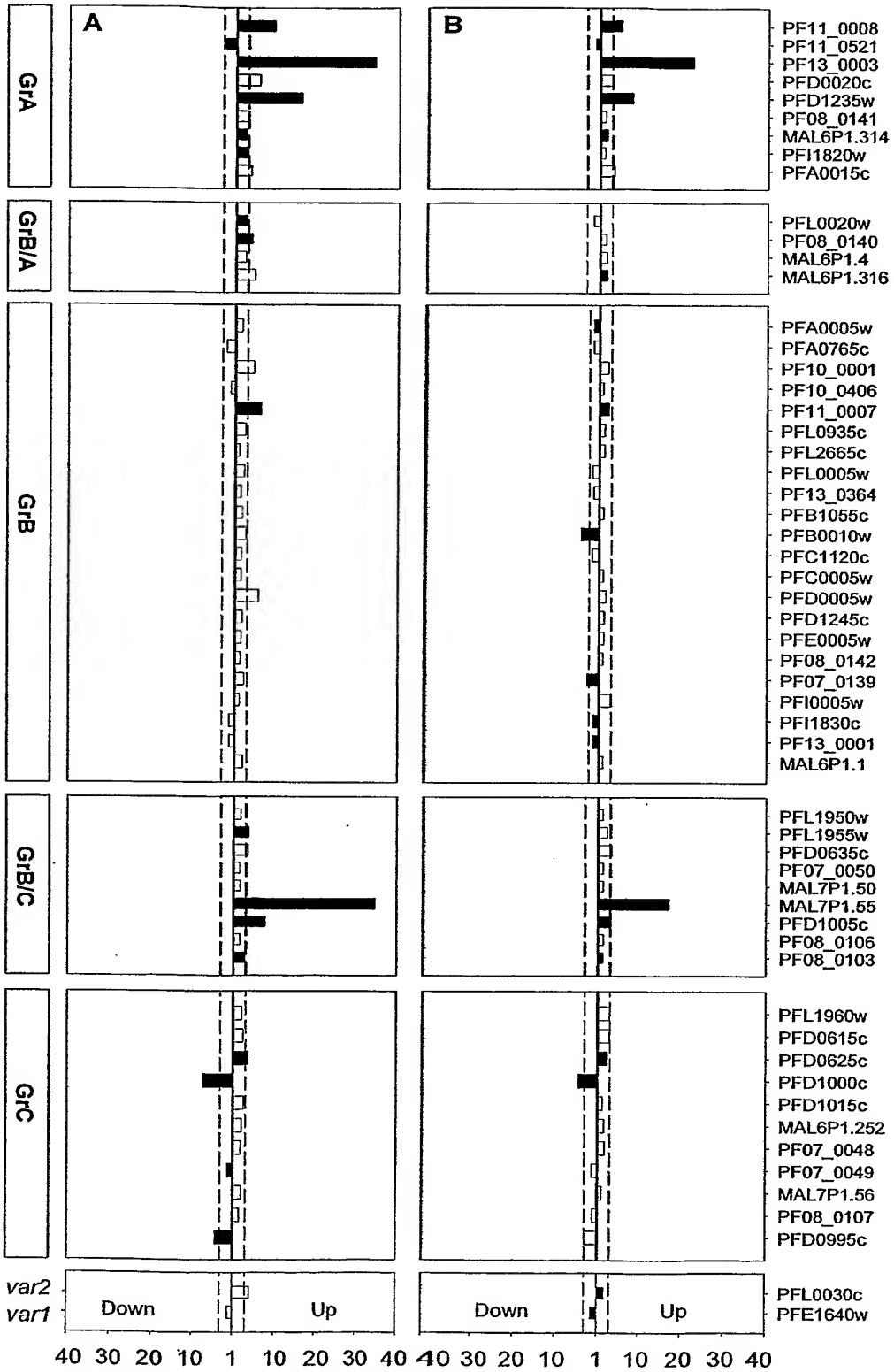

A
B
GrA
GrB/A
GrB
GrB/C
GrC
var2
var1
Down
Up
Down
Up
PF11_0008
PF11_0521
PF13_0003
PFD0020c
PFD1235w
PF08_0141
MAL6P1.314
PFI1820w
PFA0015c
PFL0020w
PF08_0140
MAL6P1.4
MAL6P1.316
PFA0005w
PFA0765c
PF10_0001
PF10_0406
PF11_0007
PFL0935c
PFL2665c
PFL0005w
PF13_0364
PFB1055c
PFB0010w
PFC1120c
PFC0005w
PFD0005w
PFD1245c
PFE0005w
PF08_0142
PF07_0139
PFI0005w
PFI1830c
PF13_0001
MAL6P1.1
PFL1950w
PFL1955w
PFD0635c
PF07_0050
MAL7P1.50
MAL7P1.55
PFD1005c
PF08_0106
PF08_0103
PFL1960w
PFD0615c
PFD0625c
PFD1000c
PFD1015c
MAL6P1.252
PF07_0048
PF07_0049
MAL7P1.56
PF08_0107
PFD0995c
PFL0030c
PFE1640w
40 30 20 10 1 10 20 30 40 40 30 20 10 1 10 20 30 40

Fig. 20

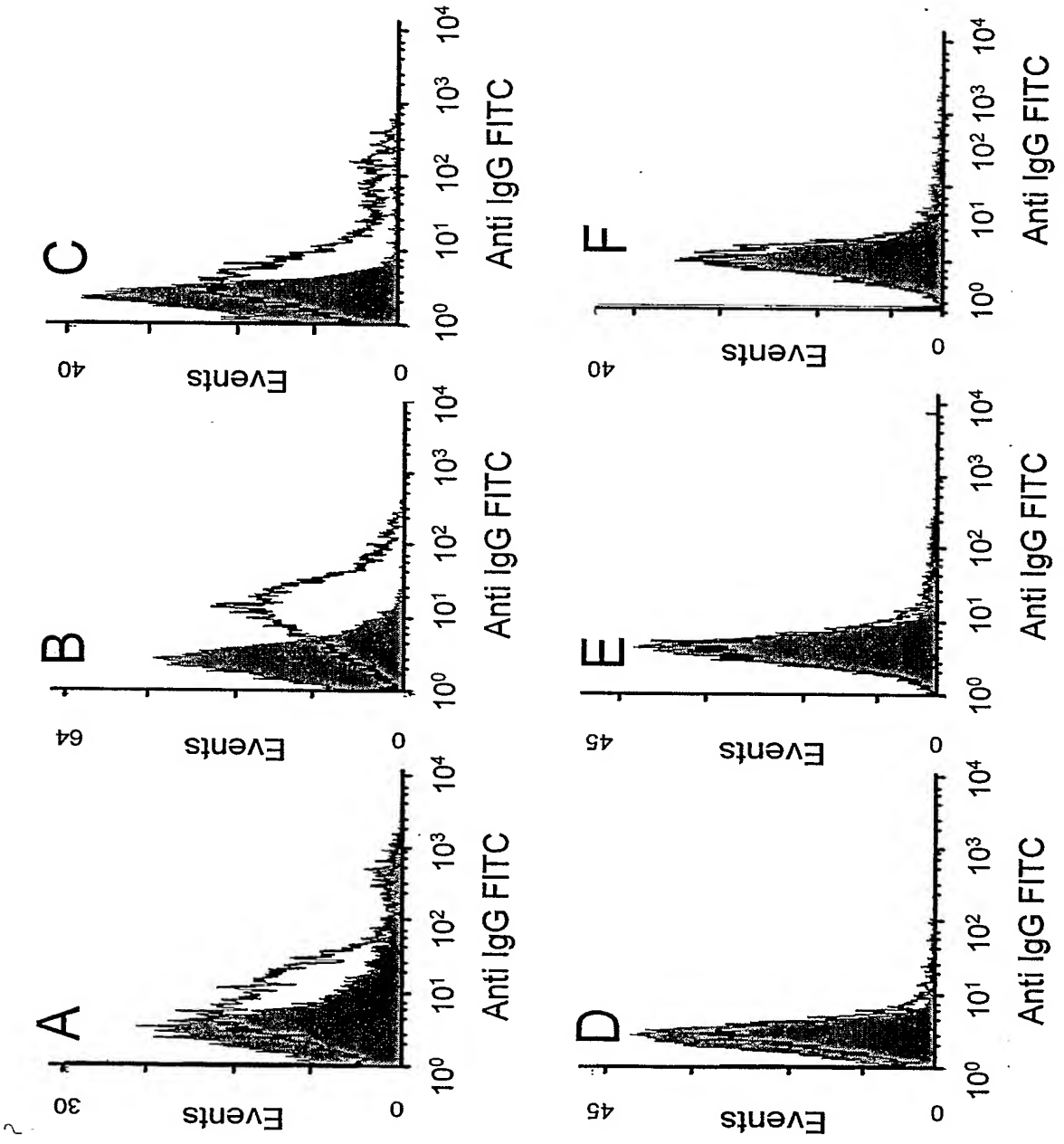



Fig. 21

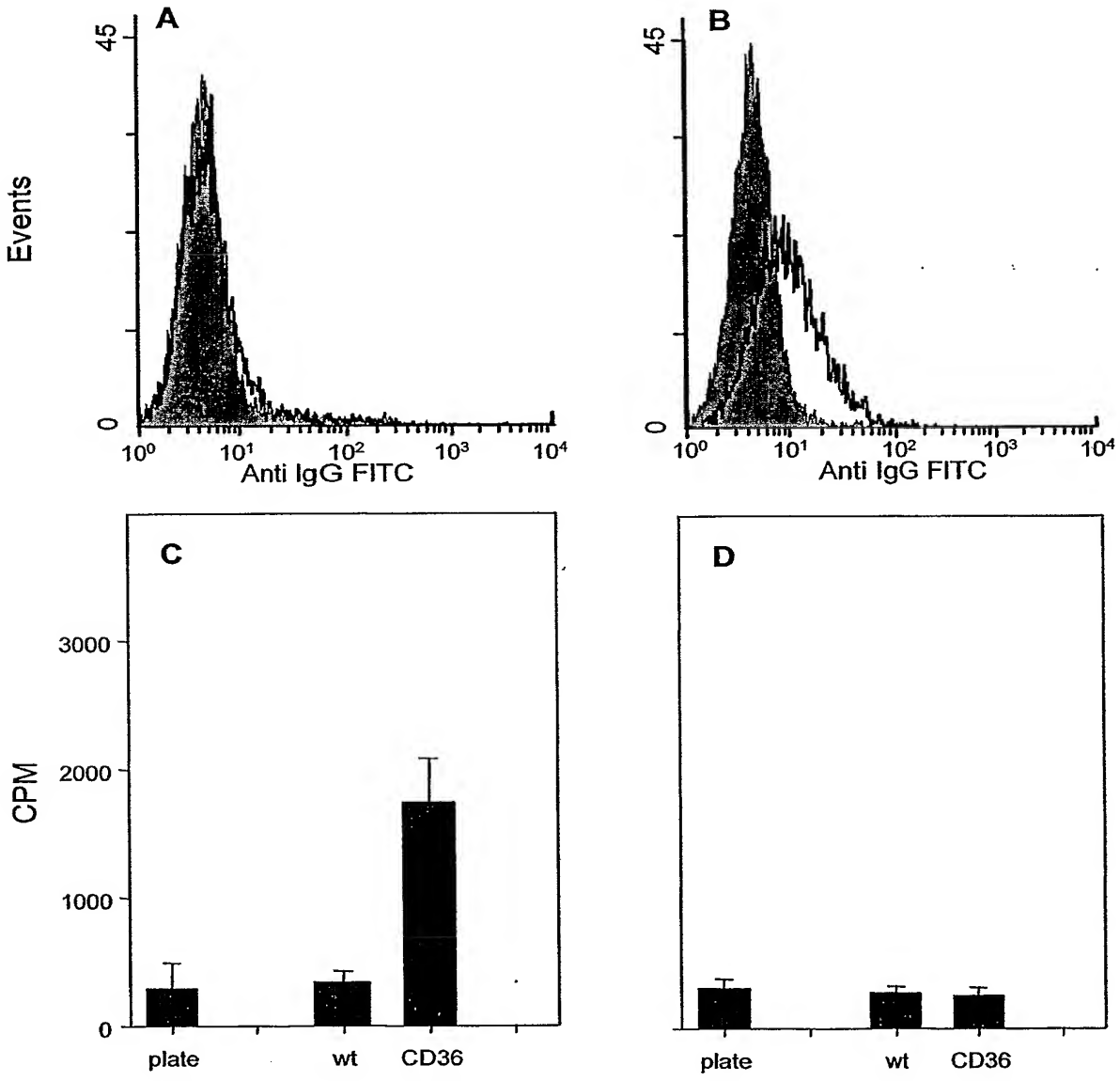

A
B
45
0
Events
$10^0$ $10^1$ $10^2$ $10^3$ $10^4$
Anti IgG FITC
C
D
3000
2000
1000
0
CPM
plate
wt
CD36

Fig. 22

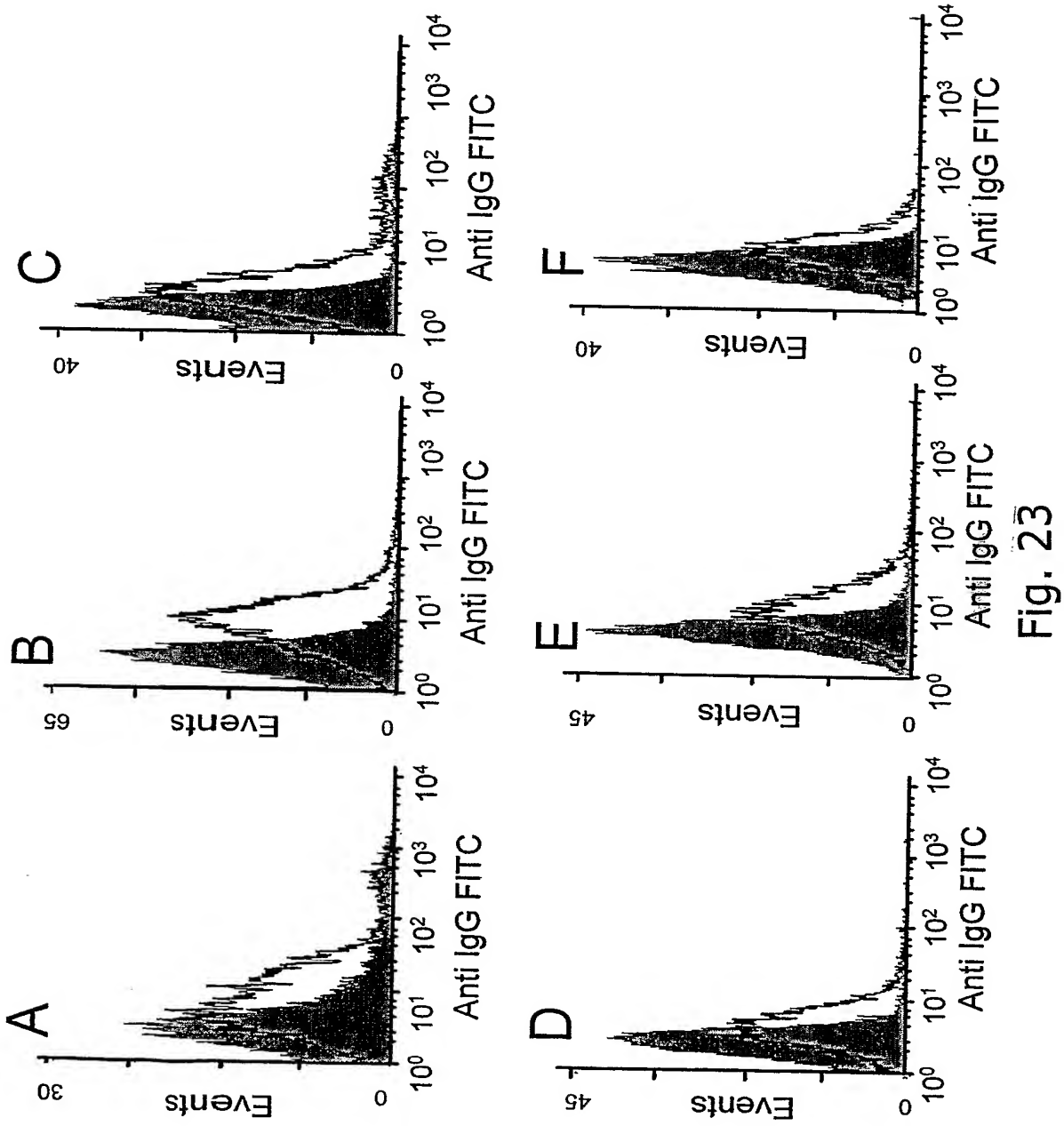



Fig. 23